

# SOCIO ECONOMIC FACTORS INFLUENCING THE EXTENT OF ADOPTION OF IMPROVED GINGER (*ZINGIBER OFFICINALE*) CULTIVATION BY THE FARMERS IN RI-BHOI DISTRICT OF MEGHALAYA

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## ABSTRACT

*The study examined the socio-economic factors that influenced the extent of adoption of ginger cultivation by the farmers in Ri-Bhoi district of Meghalaya. 120 ginger growers were selected for the purpose of the study. Ex-post facto research was followed. The collected data were processed through descriptive statistics, correlation analysis and regression analysis. Results below show various frequency and percentages of certain socio-economic characteristics. Correlation analysis revealed that variables namely family type, size of operational land holding, occupational status, mass media exposure, extension contact, risk preference, economic motivation. Further, for regression analysis, the variables which were found to have significant relationship with the dependent variable were considered. Thus, this signified that seven variables taken together could explain 54.1 percent of the total variation in respondent's extent of adoption. The most important constraint faced by the majority 100.00 per cent of the ginger growers was having no proper storage facilities, and this was ranked as first amongst the other major constraints. The farmers had suggested a number of measures regarding solving of the problems they were facing, but the most important measure suggested by majority 100.00 per cent of the ginger growers were that the Govt. should make arrangements for proper storage facilities. Hence, this measure was ranked first amongst other measures.*

**KEYWORDS:** *Zingiber officinale*, Socio-Economic Factors & Zingiberaceae

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## INTRODUCTION

Ginger (*Zingiber officinale* Roscoe.) is one of the important cash crops and spices grown in India and in many other tropical and sub-tropical regions of the world. Ginger, the rhizome or the underground modified stem of the plant belonging to the 'Zingiberaceae' family, is an important commercial spice crop grown from very ancient times in India. Northeast India is also considered as an important ginger growing area and states like Meghalaya, Arunachal Pradesh and Mizoram are found to be the leading ginger producing states. The state of Meghalaya, which is termed as the Scotland of the East, is one of the important states of the North Eastern Region. Ginger is an important cash crop of Meghalaya state which in turn plays an important role in the farmer's economy. Meghalaya is the second largest producer of ginger in the north eastern region. It has about 9752 hectares of land under ginger cultivation and produces nearly 63251 metric tonnes of ginger annually. In Meghalaya, the Ri-Bhoi district ranks third in terms of ginger production producing about 10500 metric tonnes of ginger from a land of 10574 hectares (2013-14). Likewise, in other states of the region, ginger cultivation is being done in almost all the districts, but the important ginger producing districts are East Garo hills, West Garo hills, East Khasi hills, South West Khasi hills and West Jaintia hills. Ginger is

an important cash crop and plays an important role in rural economy of Khasi farmers (Triparthiet *al.* 2008). List of varieties being grown in the state are Nadia, Khasi local, Sying met, Syingmakhir, Ing bah, Syingsmoh, Moran and Rio de Janeiro.

### Statement of the Problem

Ginger is one of the prominent crops in the spice economy of India. And, India is also one of the largest producer as well as major exporter of ginger in the world. Research on adoption can help in understanding the reasons for the gap between the potential yield and the actual yield in farmer's field and in formulating proper extension strategies for reducing the gap by critical analysis of the factors causing the gap. Extension research on ginger has been found to be very scarce in Meghalaya, though it is a commercial crop and has produced about 63251 MT of ginger in the year 2013-14. Although new varieties and improved package of practices are being introduced by the Dept. of Agriculture, to find out up to what extent these improved varieties and practices have been adopted by the farmers, to know the factors influencing the extent adoption as well as to find out the problems hindering the adoption of improved ginger cultivating practices, the present study has been undertaken.

It is against this background that, this study sought to provide answers to the following research questions:

- How do socio-economic factors influence the extent of adoption of improved practices of ginger cultivation?
- What are the constraints faced by the farmers in adopting improved ginger cultivation practices?

### METHODOLOGY

The present study was conducted in Ri-Bhoi district of Meghalaya. There are three (3) development blocks viz., Umling, Umsning and Jirang in Ri-Bhoi district. The Umsning development block was purposively selected for carrying out the present piece of work because of the overall acreage and the production point that was being taken into consideration. From the selected development block, six number of villages namely UmroiMadan, Mawbri, Liarkhla, UmranNiangbyrnai, Nongrimladew, Kyrдем were randomly selected from the number of ginger growing villages, so as to carry out the present study. A list of ginger growing farmers was prepared for each of the selected villages. From those lists, a total sample of 120 farmers was selected as respondents for the study, by following proportionate random sampling technique. The data were collected through structured interview schedules. The selected characteristics of the respondents included in the present study were socio-personal characteristics, communicational and psychological characteristics. Certain scales were measured with the help of a structured schedule. While others were measured with the help of certain established scales, statistical analysis was decided, according to the objectives of the present study. Simple frequencies, percentage, mean standard, deviation and coefficient of variation were calculated. And along with it, Karl Pearson's correlation co-efficient, regression 't' test and ranking were also used for analysis

### RESULTS AND DISCUSSIONS

#### Socio-Economic and Demographic Characteristics

The study revealed that majority of the respondents was middle aged (53.33%) and illiterate (27.5%). Majority of the respondents (55.83%) were found to have joint families. In case of size of operational land holding, it was found that majority (53.33%) had marginal land holdings. Most of the respondents (90.83%) had medium annual income followed by respondents who mostly had cultivation (42.50%) as their occupational status. As regards to mass media exposure, the

level of mass media exposure of (55.83%) respondents was mostly medium, and regarding the respondents contact to different mass media, (35.00%) of the respondents sometimes got information from newspapers. Radio as a source of information was never used by majority (50.83%) of the respondents. It can be observed that (38.34%) of the respondents who sometimes got information from televisions. It was observed that none of the respondents adopted the use of internet for information purpose. It can be observed that (42.5%) of the respondents never used mobile phones for information purpose. Agricultural bulletin as a source of information was sometimes used by majority (48.33%) of the respondents. Documentary as a source of information was never used by majority (59.17%) of the respondents. Exhibitions as mass media were sometimes used by majority (40.83%) of the respondents. It can be observed that (45.83%) of the respondents sometimes used demonstrations as a mode of receiving information. Majority of the respondents (55.83%) had never used other modes of mass media. Extension contact was also found to be medium in majority (57.5%) of the respondents. Regarding the risk preference of the respondents, majority (83.33%) were found to be medium and lastly (63.33%) of the respondents were found to be medium in economic motivation.

**Table 1: Distribution of Respondents According to their Socio-Economic Characteristics (N=120)**

| Category                          | Score Range          | Frequency | Percentage |
|-----------------------------------|----------------------|-----------|------------|
| Age                               |                      |           |            |
| Young                             | Up to 35             | 38        | 31.67      |
| Middle                            | 36-50                | 64        | 53.33      |
| Old                               | 51 and above         | 18        | 15.00      |
| Educational level                 |                      |           |            |
| Illiterate                        | 0                    | 33        | 27.5       |
| Literate without formal education | 12                   | 40        | 3.330      |
| Literate but below primary level  |                      |           |            |
| Primary school                    | 3                    | 21        | 17.5       |
| Middle school                     | 4                    | 26        | 21.67      |
| High school                       | 5                    | 24        | 20.00      |
| Higher secondary                  | 6                    | 7         | 5.83       |
| Diploma /certificate course       | 7                    | 0         | 0          |
| Graduate                          | 89                   | 50        | 4.170      |
| Post graduate and above           |                      |           |            |
| Family Type                       |                      |           |            |
| Nuclear                           | 1                    | 53        | 44.17      |
| Joint                             | 2                    | 67        | 55.83      |
| Size of Operational Land Holding  |                      |           |            |
| Marginal                          | Below 1.00 ha        | 64        | 53.33      |
| Small                             | 1 - 2 ha             | 31        | 25.84      |
| Semi-medium                       | 2 – 4 ha             | 19        | 15.83      |
| Medium                            | 4 - 10 ha            | 6         | 5.00       |
| Large                             | Above 10 ha          | 0         | 0.00       |
| Annual Income                     |                      |           |            |
| Low                               | <• 10225.88          | 0         | 0          |
| Medium                            | • 10225.88-170056.20 | 109       | 90.83      |
| High                              | >• 170056.20         | 11        | 9.17       |
| Occupational Status               |                      |           |            |
| Cultivation                       | 1                    | 51        | 42.50      |
| Cultivation + skilled labor       | 2                    | 35        | 29.16      |
| Cultivation + business            | 3                    | 28        | 23.34      |
| Cultivation + service             | 4                    | 6         | 5.00       |
| Mass Media Exposure               |                      |           |            |
| Low                               | < 16.02              | 30        | 25.00      |
| Medium                            | 16.02 - 23.62        | 67        | 55.83      |

| Table 1: Contd.,    |               |    |       |
|---------------------|---------------|----|-------|
| High                | > 23.62       | 23 | 19.17 |
| Extension Contact   |               |    |       |
| Low                 | < 19.05       | 24 | 20.00 |
| Medium              | 19.05 - 23.29 | 69 | 57.50 |
| High                | > 23.29       | 27 | 22.50 |
| Risk Preference     |               |    |       |
| Low                 | <23.98        | 0  | 0.00  |
| Medium              | 23.98-28.30   | 96 | 80.00 |
| High                | > 28.30       | 24 | 20.00 |
| Economic Motivation |               |    |       |
| Low                 | <24.68        | 20 | 16.67 |
| Medium              | 24.68-29.22   | 76 | 63.33 |
| High                | >29.22        | 24 | 20.00 |

### Relationship between Socio-Economic and Demographic Characteristics

To find out the relationship between ten selected independent variables and the dependent variable, Pearson's correlation coefficient was worked out.

Analysis of socio economic characteristics and extent of adoption indicated that age of the respondents had no significant relationship with the overall extent of adoption. Similar kinds of findings were also reported by Bezborra and Bordoloi (1979), Makarauet *al.*, (2013) and Singh (1991).

Education of the respondents had no significant relationship with the overall extent of adoption. Therefore, the null hypothesis ( $H_0$ 2), i.e. there is no significant relationship between the education level of the farmers and their extent of adoption could not be rejected.

The findings of the correlation analysis showed that family type of the respondents was found to be positively and significantly correlated with the overall extent of adoption. The result of this study was also supported by Kiranmaiyeet *al.*, (2015). Hence, this indicated that the extent of adoption was more with farmers who had joint family type.

**Table 3: Relationship between Independent Variables and Overall Extent of Adoption of Improved Ginger Cultivation Practices**

| Independent Variables            | Correlation Coefficient (r) |
|----------------------------------|-----------------------------|
| Age                              | 0.078                       |
| Educational level                | -0.021                      |
| Family type                      | 0.276*                      |
| Size of operational land holding | 0.222*                      |
| Annual income                    | 0.128                       |
| Occupational status              | 0.242*                      |
| Mass media exposure              | 0.459*                      |
| Extension contact                | 0.416*                      |
| Risk preference                  | 0.476*                      |
| Economic motivation              | 0.470*                      |

\*Significant at 0.05 level probability

Operational land holding of the respondents was found to be positively and significantly correlated with the overall extent of adoption. This indicated that more the size of operational land holding more was the extent of adoption. This might be due to the fact that, respondents who have more area under cultivation are more aware and conscious regarding their extent of adoption. Such findings were also reported by Rogers (1961), Sanders (1995) and Bokuloet *al.*

(2015).

Annual income of the respondents had no significant relationship with the overall extent of adoption. And, similar or relevant findings were reported by Singh (2005), More *et al.*, (2014) and Bokuloet *al.*, (2015).

Occupational status was found to have a positive and significant relationship with the extent of adoption. And, relevant findings was reported by Singh (2005)

Mass media exposure of the respondents was found to possess a positive and significant relationship with the overall extent of adoption. This revealed that when the respondents were exposed to mass media, and then better was their adoption behavior. Similar findings were reported by Kiranmmayiet *al.* (2015).

The finding of the correlation analysis also revealed that extension contact of the respondents was found to be positively and significantly correlated with the overall extent of adoption. It indicated that more the extension contact more was the extent of adoption. This might be due to the fact that when farmers had more contact with extension personnel's, this helped them in acquiring more information, get more material support, develop their confidence and thereby increasing the credibility of improved ginger cultivation practices. Similar findings were also reported by Raut (1974), Shukla (1980) and Folorunso and Adenuga (2013).

Risk preference of the respondents was found to be positive and significantly correlated with the overall extent of adoption. It indicated that more the risk preference of the respondents more was the adoption. It might be due to the fact that lower the risk preference more was the chance in making big profit which leads to more extent of adoption of improved ginger cultivation practices by the respondents.

It was revealed, economic motivation of the respondents was found to be positively and significantly correlated with the extent of adoption. This indicates that the more economic motivation of the respondents more was the adoption. This might be due to the fact that economic motivation motivates a farmer to adopt modern ways of farming, as well as develop positive attitude towards modes farming techniques. Similar findings were reported by Kaushal (2010), Darnal and Banyopadhy (2014) and More *et al.* (2014).

### **Influence of the Selected Independent Variables on the Dependent Variable**

Regression analysis was employed to determine the combined effect of independent variables on the dependent variable. The independent variables which were found to have significant relationship with the dependent variables were considered for regression analysis.

The multiple regression analysis with all 7 predictors produced  $R^2 = 0.541$ , Adjusted  $R^2 = 0.512$ ,  $F = 18.88$ ,  $p < 0.01$ . Since, the F value was significant at 0.01 level of significant so the null hypothesis ( $H_0$ ), was rejected. The  $R^2$  value 0.541 clearly signifies that seven independent variables taken together could explain 54.1 per cent of the total variation in respondent's extent of adoption of improved packages of ginger cultivation. This model explains that the selected predictors accounted for 54.1 per cent of adoption behavior. The findings indicated that 45.9 per cent of the variations in the dependent variable remain unexplained. So, there is scope for incorporating more number of relevant variables in the regression equation for future study, which would explain the remaining part of the variation in the dependent variable.

**Table 4: Influence of the Selected Independent Variables on the Dependent Variable**

| Variables                        | R <sup>2</sup> | Adjusted R | F Value | Regression Coefficient(B) | 'T' Value |
|----------------------------------|----------------|------------|---------|---------------------------|-----------|
| Family type                      | 0.541          | 0.512      | 18.88** | 0.288                     | 0.806     |
| Size of operational land holding |                |            |         | 0.423**                   | 2.370     |
| Occupational status              |                |            |         | 0.482**                   | 2.406     |
| Mass media exposure              |                |            |         | 0.182**                   | 3.601     |
| Extension contact                |                |            |         | 0.291**                   | 3.575     |
| Risk preference                  |                |            |         | 0.305**                   | 3.478     |
| Economic motivation              |                |            |         | 0.344**                   | 4.390     |

\*\*Significant at 0.01 level of probability

Further, analysis of 't' value of regression coefficients (b) indicated that size of operational land holding, occupational status, mass media exposure, extension contact, risk preference, economic motivation of ginger growers had significant contribution in influencing the extent of adoption of improved packages of ginger cultivation.

#### **Constraints Faced by the Farmers in Adopting Improved Ginger Cultivation Practices and the Measures Suggested by them**

The farmers were asked open ended questions to mention the most important constraints they faced in adopting improved practices of ginger cultivation in their situation. Then, they were further asked to suggest measures to overcome the constraints mentioned.

The findings regarding constraints mentioned by farmers have been presented in Table 5

**Table 5: Constraints Faced by Farmers in Adoption of Improved Ginger Cultivation Practice (N=120)**

|     | Constraints   | Frequency | Percentage | Rank |
|-----|---|-----------|------------|------|
| 1.  | There are no proper storage facilities                                  | 120       | 100.00     | I    |
| 2.  | Inadequate transport facilities   | 112       | 93.33      | II   |
| 3.  | Low level of remunerative price due to involvement of middlemen         | 100       | 83.34      | III  |
| 4.  | Rhizome rot of ginger   | 98        | 81.16      | IV   |
| 5.  | Unaware of credit facilities in the area as well as procedures involved | 95        | 79.17      | V    |
| 6.  | Problem of price in-stability   | 93        | 77.50      | VI   |
| 7.  | High cost of rhizome/seeds  | 82        | 70.83      | VII  |
| 8.  | Distance problems to weekly markets                                     | 76        | 68.33      | VIII |
| 9.  | High cost of fertilizers  | 72        | 60.00      | IX   |
| 10. | Poor economic conditions of farmers                                     | 65        | 54.17      | X    |
| 11. | Lack of rural electrification/constant power interruption               | 55        | 45.83      | XI   |

Of all problems, the 1<sup>st</sup> problem was non-availability of proper storage facilities. Because of this, farmers suffered huge losses as they were unable to store their produce after harvest. And, all (100%) of the respondents faced this problem. The 2<sup>nd</sup> problem was having inadequate transport facilities and this problem was faced by (93.33%) of the farmers. This created lots of tensions for them as farmers found it difficult to transport produce to different places. 3<sup>rd</sup> problem was low level of remunerative prices due to involvement of middlemen. This problem was faced by (83.34%) of the farmers. It was a problem, where farmers were not getting good prices for crops as prices were manipulated by middlemen who worked their way through, so that they could earn profits for themselves. Constant dying of ginger rhizome due to a disease known as ginger-rot was the 4<sup>th</sup> problem. About (81.16%) of the ginger growers faced this problem. The 5<sup>th</sup> problem was that farmers were unaware of credit facilities in the areas and also did not have proper knowledge towards procedures involved in taking or giving of credit. And, (79.17%) of farmers faced this problem. Problem of price instability was the 6<sup>th</sup> problem. As a result, (77.5%) farmers had to suffer losses as prices fluctuated every now and then. The 7<sup>th</sup> problem was high cost of

rhizomes. And, because of high price, almost (70.83%) of the respondents had problems regarding sale and purchase of rhizomes. The 8<sup>th</sup> problem was the distance of the weekly markets from the farmer's villages. About (68.33%) of the farmers faced this problem, because they would always have to travel long distance for marketing. The 9<sup>th</sup> problem was high cost of fertilizers. And because of this, 60% of the farmers could not afford to buy and use fertilizers. Poor economic condition of farmers was the 10<sup>th</sup> problem and it was a problem faced by (54.17%) of the farmers. This was mainly due to the fact that most of the farmers belonged to poor groups of families, hence they could not raise their living conditions. Lack of rural electrification or constant power interruption was the last problem of all faced by (45.83%) of the farmers. Because of this, they would always have improper electricity at home and would not have the ability to utilize certain mass media technologies available with them.

## CONCLUSIONS

Thus, from the study it can be concluded that taking certain efforts one can help accelerate the adoption of improved ginger cultivation practices particularly in seed treatment, fertilizer application, weed control and plant protection measures, while promotion of education is of course a much more general task. Provisions of timely and suitable trainings may be of great help for improving of knowledge skills as well for building favorable attitude towards crop cultivation. The farmers' risk preference can also be more developed by personal contacts, trainings and various other extension methods. In promoting adoption, the extension workers should consider the vital roles of mass media exposure as these were found to be significantly associated with the extent of adoption. So, it is necessary for the government to give importance on the use of ICT tools, especially mobile phone technology, dissemination of market information, latest technologies etc. Through this study, it was also found that majority of the farmers had marginal sized of land holdings. This happens to be quite the drawback because, if farmers had more land with themselves, then more amount of ginger could be grown. Therefore, it is the duty of the government and the concerned extension agencies to look into this matter and help out farmers by leasing out lands to them for certain periods of time so that they can cultivate ginger and other food crops. The findings on problems of adoption indicated that the concerned authorities should make systematic efforts in order to solve the problems of the farmers, which hinder their innovation decision process of improved cultivation practices of ginger.

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